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a. Professional Preparation.

Ph.D.	Physics, University of Michigan, 1976
M.S.	Physics/Mathematics, University of Michigan, 1971
B.S.	Physics, University of Minnesota, 1967 (cum laude with Honors)

b. Appointments.

1988–Present	Laboratory Fellow, Mathematical Modeling and Analysis Group, LANL.
2000	Visiting Fellow, Isaac Newton Institute for Mathematical Sciences, Cambridge University, Cambridge, UK
1997	UC Visiting Scholar, UC Santa Cruz Mathematics Department.
1985–1988	Deputy Group Leader, Mathematical Modeling/Analysis Group T-7, LANL.
1983–1985	Staff Member, Mathematical Modeling and Analysis Group, LANL.
1981–Present	Executive Committee, Center for Nonlinear Studies, LANL.
1982–1983	Acting Director, Center for Nonlinear Studies, LANL.
1972–1983	Staff Member, Theoretical Design Group.

c. Selected Publications.

(i) Turbulence modeling research.

1. "Navier-Stokes-alpha model: LES equations with nonlinear dispersion," J.A. Domaradzki and D.D. Holm, Special LES volume of *ERCOFTAC Bulletin*, **48** March (2001) 22-25, http://xxx.lanl.gov/abs/nlin.CD/0103036.

2. "The Navier-Stokes-alpha model of fluid turbulence," C. Foias, D.D. Holm and E.S. Titi, *Physica D*, to appear.

3. "Direct numerical simulations of the Navier-Stokes alpha model," S. Y. Chen, D.D. Holm, L. G. Margolin and R. Zhang, *Physica D*, **133** (1999) 66-83.

4. "A connection between the Camassa-Holm equations and turbulence flows in pipes and channels," S. Chen, C. Foias, D.D. Holm, E.J. Olson, E.S. Titi and S. Wynne, *Phys. Fluids*, **11** (1999) 2343-2353.

5. "The Camassa-Holm equations as a closure model for turbulent channel and pipe flows," S. Chen, C. Foias, D.D. Holm, E.J. Olson, E.S. Titi and S. Wynne, *Phys. Rev. Lett.*, **81** (1998) 5338-5341.

(ii) Dynamical systems research.

1. "Integrable vs nonintegrable geodesic soliton behavior," O. Fringer and D.D. Holm, *Physica D* **150** (2001) 237-263, http://xxx.lanl.gov/abs/solv-int/9903007.

2. "On Billiard Solutions of Nonlinear PDE's," M. S. Alber, R. Camassa, Y. N. Fedorov, D.D. Holm and J.E. Marsden, *Phys. Lett. A* **264** (1999) 171-178.

3. "Homoclinic Orbits and Chaos in a Second-Harmonic Generating Optical Cavity," A. Aceves, D.D. Holm, G. Kovačič and I. Timofeyev *Phys. Lett. A* **233** (1997) 203-208.

4. "Homoclinic orbits in the Maxwell-Bloch equations with a probe," D.D. Holm, G. Kovacic and T.A. Wettergren, *Phys. Rev. E*, **54** (1996) 243-256.

5. "On the Link between Umbilic Geodesics and Soliton Solutions of Nonlinear PDE's," M. Alber, R. Camassa, D.D. Holm and J.E. Marsden, *Proc. Roy. Soc.* **450** (1995) 677-692.

d. Synergistic Activities. (1991-2000):

1995–2000	Visiting Professor (about one month each year), Isaac Newton Institute for Mathematical Sciences, Cambridge University, Cambridge, UK
1991–2000	Co-organizer/Plenary Speaker, Various Conferences
1986–1994	Founding Editor, *Physics Letters A*, Nonlinear Science Section
1991	Member, Theoretical Design Team, Joint Verification Experiment for US/Soviet Threshhold Testban Treaty

PRIMARY SCIENTIFIC INTERESTS:

Nonlinear science – ranging from integrable to chaotic behavior – especially nonlinear dynamics in optics and fluids. In nonlinear optics Holm is studying dynamics of laser-cavity optics and telecommunication pulses in fibers.[1] In fluid dynamics Holm is applying averaging, asymptotics and other methods from nonlinear dynamics, in order to describe and assess the effects of subgrid scales and turbulence in global ocean circulation and models. Recent work applies the Euler-Poincaré theory to develop new turbulence closures for large eddy simulation. These are the so-called "alpha models" of turbulence. These models provide a fundamental mathematical foundation for climate modeling.

SUMMARY of EXPERIENCE:

Nearly thirty years experience with Los Alamos National Laboratory (LANL) performing R & D coordination in issues of national and international scientific interest in applied nonlinear dynamics research, theoretical physics and experimental design. 1984 National Award of Excellence for Significant Contribution to US DOE Programs. Theoretical Design Team member in 1991 Joint Verification Experiment for US/Soviet Threshhold Testban Treaty. Founding Nonlinear Science Editor for Physics Letters A. Founding member and past Director of the LANL Center for Nonlinear Studies (CNLS), member and past co-leader of the Mathematical Modeling and Analysis Group (T-7) at LANL. Now Los Alamos National Laboratory Fellow. Primary supervisor of twenty one post doctoral fellows. Organizer of more than twenty scientific conferences and workshops.

LOS ALAMOS NATIONAL LABORATORY HONORS AND AWARDS:

1988–present	Laboratory Fellow
1997	Los Alamos National Laboratory Achievement Award
1984	National Award of Excellence – Significant Contribution, US DOE Programs
1984	Los Alamos National Laboratory, Distinguished Performance Award

e. Collaborators & Other Affiliations.

(i) Collaborators during past 48 months.

Mark Alber (Notre Dame), R. Camassa (UNC), S.Y. Chen (Johns Hopkins), J. A. Domaradzki (USC), C. Foias (U Indiana), G. Kovacic (RPI), J. E. Marsden (Caltech), E. S. Titi (UC Irvine).

(ii) Graduate Advisors: G. Kane (U Michigan)

(iii) Thesis Advisor and Postgraduate-Scholar Sponsor over the last five years.

B. Wingate (LANL), S. Shkoller (UC Davis), B. Luce (LANL), B. Nagida (LANL).

[1] UNITED STATES PATENT # 6,157,762 patents the idea of using nonlinear amplifying loop mirrors (NALMs) to stabilize, shape and regenerate optical pulses in fibers at high bit rates. The idea treats the pulse propagation and re-amplication process as an iterated mapping. See I. Gabitov, D. D. Holm, B. Luce and A. Mattheus, *Optics Lett.* **20** (1995) 2490-2492.